# JBIS journal of the british interplanetary society

VOLUME 32 1979

*GENERAL EDITOR:* PROFESSOR G. V. GROVES

*SECTION EDITORS:*

*ASTRONAUTICS HISTORY* M. R. SHARPE

*INTERSTELLAR STUDIES* DR. A. R. MARTIN

*SATELLITE CONTROL AND DATA PROCESSING* DR. R. HOLDAWAY

*SPACE COMMUNICATIONS* P. J. CONCHIE

*SPACE & EDUCATION* P. J. CONCHIE & G. J. N. SMITH

*SPACE SCIENCE* DR. G. E. HUNT

*SPACE TECHNOLOGY* DR. R. C. PARKINSON

*Published for THE BRITISH INTERPLANETARY SOCIETY LTD., (No. 402498) by SPACE EDUCATIONAL AIDS LTD., (No. 741211). Registered Office: 27/29 South Lambeth Road, London, SW8 1SZ, England.* *Copyright © 1979. All rights reserved. No part of this volume may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying or recording by any information storage or retrieval system without written permission from the Publishers.*
*Printed by Unwin Brothers Ltd., at the Gresham Press, Old Woking, Surrey, England.*

## AUTHOR INDEX


| | | |
|---|---|---|
| Armstrong, A. C. and Brimblecombe, P. | A Conspectus of Computer Aided and Air-Photo Interpretation Techniques for the Study of Landsat Imagery | 3 |
| Armstrong, S. | The MARECS Payload | 180 |
| Bilstein, R. E. | From the S-IV to the S-IVB: The Evolution of a Rocket Stage for Space Exploration | 452 |
| Bury, J. S. | The Planet Venus | 123 |
| Charlton, C. P. *et al* | The Control of a Hard X-ray Imaging Spectrometer On Board the SMM Using Two Mutually Redundant Microprocessors | 71 |
| Collette, R. C. and Herdan, B. L. | Satellite Broadcasting in Europe and the Associated European Space Agency Programme | 255 |
| Compton, W. D. | Science and Manned Spaceflight: The Skylab Experience | 463 |
| Curtis, S. A. | The Use of the German V-2 in US for Upper Atmosphere Research | 443 |
| Davidoff, M. R. | Satellite Systems | 339 |
| Driggers, G. W. | A Scheme for Transport of Lunar Materials to Utilization Sites in Earth Orbit | 24 |
| Ehricke, K. A. | The Extraterrestrial Imperative: Part 1; Evolutionary Logic | 311 |
| " | The Extraterrestrial Imperative: Part 2 | 410 |
| Fennessey, E. | Telecommunications AD 2000 | 371 |
| Golding, J. E. *et al* | The ECS System From a Users Viewpoint | 167 |
| Golton, E. and Dunsford, E. | Image Processing for the IUE Satellite | 47 |
| Gunzenhauser, R. *et al* | A Microcomputer Based System For On-Board Attitude Control Applications | 15 |
| Hall, R. C. | Project Ranger: Forging a New Era in Space Science | 459 |
| Hameetman, G. J. | IRAS On-Board Software | 59 |
| Hartford, M. | Verdict from Alexandria | 358 |
| Hassal, T. R. C. | Educational Broadcasting for Developing Countries: A Case for the Use of Satellites | 262 |
| Holmes, D. C. | Tempus: A Proposal for an International Time Transfer and Precision Tracking Satellite | 347 |
| Huddleston, H. T. and Fox, J. | Metal Extraction from Lunar Ore | 27 |
| Kottkamp, E. | Spacelab – Flight Unit Assembly | 330 |
| Lewis, J. R. *et al* | The OTS Test Programme | 173 |
| Luksh, W. | Commercial Applications of Space Telecommunications | 352 |
| Martin, A. R. and Bond, A. | Nuclear Pulse Propulsion: A Historical Review of an Advanced Propulsion Concept | 283 |
| Martin, B. R. and Van Holtz, R. | IRAS Ground Operations and Preliminary Data Processing | 65 |
| Matloff, G. L. | The Interstellar Ramjet Acceleration Runway | 219 |
| McLaurin, D. and Curran, T. J. P. | In-Orbit Performance of the Orbital Test Satellite (OTS) | 186 |
| Meot-Ner, J. and Matloff, G. L. | Directed Panspermia: A Technical and Ethical Evaluation of Seeding Nearby Solar Systems | 419 |
| Michaud, M. A. G. | SETI Hearing in Washington | 116 |
| Mistrik, I. | Zodiacal Light Experiment for the Solar Probe Helios: Data Processing and Evaluation | 53 |
| Molton, P. M. | Exobiological Notebook | 318 |
| Morgan, W. L. | Geosynchronous Satellite Log | 390 |
| Morgan, W. L. and Edelson, B. I. | The Orbital Antenna Farm Concept | 243 |
| Moseley, J. | Sir Robert Stawell Ball, F.R.S. | 156 |
| " | Bonnycastle's Astronomy | 354 |
| " | Derham's Astro-theology | 396 |
| Pace, G. W. | The Use of Binary Stars as Time Makers in Interstellar Communication | 215 |
| Page, B. R. | The Creation of NASA | 449 |
| Pant, A. K. *et al* | "Acetonitrile" : A Plausible Source of Amino Acids on the Primitive Earth | 223 |
| Pathak, C. K. *et al* | Photochemical Synthesis of Amino Acids from Aqueous Solutions of Ethyl Alcohol Ammonia/Nitrogen Under Varied Conditions | 103 |
| Perschy, J. A. | The Seasat-A Satellite Radar Altimeter Spaceborne Computer | 9 |
| Raitt-Brown, C. and Haigh, A. | The European Communication Satellite and Derivatives | 191 |
| Ross, M. | The Likelihood of Finding Extraterrestrial Laser Signals | 203 |

| | | |
|---|---|---|
| Sarathay, T. P. and Saha, M. K. | Multiple Access Considerations for a Satellite Communication System for a Developing Country | 32 |
| Scherer, L. R. | Space Transportation System: Status Report | 364 |
| Skinner, G. K. | Image Processing Techniques for the Rotation Modulation Collimator Experiment on Ariel 5 | 77 |
| Sobotta, W. | Spacelab – Europe's First Manned Spacecraft | 334 |
| Spall, N. J. | The Physical Appearance of Intelligent Aliens | 99 |
| Stull, M. A. | On the Significance of the Apparent Absence of Extraterrestrials on Earth | 221 |
| Sweeting, M. N. | The Amateur Space Programme | 378 |
| Tang, B. | The Fundamental Dimensionless Numbers and the Possibility of Life: Part One | 84 |
| Van Stuyvenberg, J. A. | The On Board Computer for the IRAS Satellite | 43 |
| Vulpetti, G. | Multiple Propulsion Concept: Theory and Performance | 209 |
| Waldron, R. A. | The Ballistic Theory of Light and Its Implications for Space Travel | 95 |
| Windibank, M. P. | Shoeburyness: A Centre of Britain's Rocket Testing in the 19th Century | 471 |
| Winter, F. H. | The Rocket in India from 'Ancient Times' to the 19th Century | 463 |
| Winterberg, F. | Rocket Propulsion by Nuclear Microexplosions and the Interstellar Paradox | 403 |
| Wuest, W. and Chun, C. H. | Convective Thermocapillary and Thermomolecular Fluid Flow in Low-g Environment | 37 |


## FEATURES


Arecibo Observatory, The . . . 228

Correspondence . . . 119, 227, 239, 320, 436

Exobiological Notebook . . . 318

Fermi Paradox: A Forum Discussion . . . 424

National Radio Astronomical Observatory (NRAO), The . . . 107

OTS Satellite, The . . . 163

Present Position and Future of the Ariane Programme . . . 325

Saturn IB Displayed . . . 360
Seventh International Review Meeting on Communication with Extraterrestrial Intelligence (CETI) . . . 237

Space Flights and Milestones . . . 323, 363
Space Report
- AMSAT . . . 200
- ATS 6 . . . 400
- CTS . . . 199
- Fltsatcom 2 . . . 254
- Intelsat 5 . . . 200
- Landsat D . . . 198
- Satellite Ground Station . . . 198
- Satellite PO Terminal . . . 198
- Shuttle, Indonesian Agreement . . . 280
- Surrey University . . . 200

Technical Report for Loan . . . 26, 118, 261


## SUBJECT INDEX


- Amino Acids . . . 103, 223
- AMSAT . . . 200, 378
- Arecibo Observatory . . . 228
- Ariane . . . 325
- Ariel 5 . . . 77
- Astronomy
  - Bonnycastle . . . 354
  - History . . . 358
- Attitude Control . . . 15
- ATS 6 . . . 400
- Ball, Sir. Robert Stawell . . . 156
- CETI, International Meeting . . . 237
- Computers
  - Remote Sensing . . . 3
  - Satellites . . . 43
- Comsats
  - Antenna Farm . . . 243
  - Educational Broadcasting . . . 262
  - in Europe . . . 255
- Derham, William . . . 396
- DSCS II . . . 189

Earth's Atmosphere . . . . . 8
ECS . . . . . 167, 191
Extraterrestrials
on Earth . . . . . 221
Evolution . . . . . 311, 410
Intelligence . . . . . 99
Life . . . . . 84, 319

Fermi Paradox. . . . . 419, 424
Fltsatcom 2 . . . . . 254
Fluid Flow, Low-g . . . . . 37
Helios, Data Processing . . . . . 53

Image Processing . . . . . 47, 77
IRAS
Computer . . . . . 43, 59
Ground Operations . . . . . 65
Software . . . . . 59
Intelsat 5 . . . . . 200
Interstellar
Propulsion . . . . . 403, 283
Ramjet . . . . . 219
Seeding . . . . . 419
IUE, Image Processing . . . . . 47

Landsat D . . . . . 198
Landsat, Imagery Interpretation . . . . . 3
Light, Ballistic Theory . . . . . 95
Lunar Materials, to Earth Orbit . . . . . 24
Lunar Ore, Metal Extraction . . . . . 27

MARECS . . . . . 180
Materials Processing . . . . . 36
Metal, from Lunar Ore . . . . . 27
Metsat . . . . . 14
Microcomputer, for Satellites . . . . . 9, 15

National Radio Astronomical Observatory (NRAO) . 107
Nuclear Propulsion . . . . . 403

Origin of Life . . . . . 318
OTS . . . . . 163, 173, 186

Photomultipliers . . . . . 8
Propulsion
Multiple . . . . . 209
Nuclear Pulse . . . . . 283

Radio Astronomy
Arecibo . . . . . 228
NRAO . . . . . 107
Remote Sensing . . . . . 3

Satellites
Ferranti Terminal . . . . . 185
Geosynchronous Log . . . . . 390
Multiple Access . . . . . 32
PO Terminal . . . . . 198
Systems . . . . . 339
Saturn IB . . . . . 360
Seasat-A, Microcomputer . . . . . 9
SETI
Binary Star . . . . . 215
Laser Signals . . . . . 203
Washington Hearings . . . . . 116
Shoeburyness, Rocket Test Site . . . . . 471
Shuttle
Indonesian Agreement . . . . . 280
Status Report . . . . . 364
Skynet . . . . . 179
SMM . . . . . 71

Spacelab . . . . . 36, 330, 334
Surrey University . . . . . 200

Telecommunications, Space . . . . . 352, 371
Tempus . . . . . 347
Tiros-N . . . . . 14

Venus . . . . . 123

X-ray Spectrometer . . . . . 71

Zodical Light, Helios Experiment . . . . . 53

## BOOK REVIEWS

Davidoff, M. R. Using Satellites in the Classroom: A Guide for Science Educators . . 388

Hall, R. C. Lunar Impact: A History of Project Ranger . . . . . 389

Ryan, P. and Pesek, L. Solar System . . . . . 389

de San, M. G. Hypothesis on the Origin of UFO's . 434

* * * * * *